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Charcoal From Your Woodlot ?

by N. J. Hansen

USE OF charcoal for outdoor cooking has increased rapidly in the Midwest since World War II. Iowans used about 1½ million pounds in 1955. And the increase is estimated at more than 30 percent per year.

Nearly all of the charcoal used in Iowa is presently shipped in from other states. The upland timber in Iowa, however, consists primarily of dense hardwoods such as oak, hickory and ash. These timber lands often have been "high-graded"—that is, the best trees cut, and poorer trees left standing. To improve the productivity and financial return of these degraded woodlots, the first step is to get rid of the poor trees to make room for good trees.

Charcoal can be made from low-quality dense hardwoods. Sound dead trees and tops or limbs are suitable for this use. Wood from 2 inches up to 10 or 15 inches in diameter and of any length can be used. Green round wood, however, should be seasoned at least 6 months—preferably a year or more.

If you're one of Iowa's many woodland owners, it may be worthwhile to consider the possibility of making charcoal. An on-farm sideline business is one of several ways to help meet the cost-price squeeze.

Kilns: Small charcoal kilns usually are built of stabilized concrete masonry block. Cinder block is recommended but is not generally available in the state. Possible substitute materials include haydite, perlite and waylite blocks and fire brick. Kilns can be constructed to hold from 2 to 10 or more cords of wood. Materials and labor amount to around $150-$200 per cord of capacity. Kiln life ranges from approximately 100-200 "burns." Each burn requires 5-10 days for loading, firing, cooling and unloading.

Yield: A cord (128 cubic feet) of seasoned dense hardwood yields around 800-1,000 pounds of charcoal. About 10 percent of this will be "fines"—unsuited for cooking but useful in cistern filter systems. Most big sticks of wood break up readily after charcoaling, but some large lumps need to be broken down by a cracking device. Likewise, a screening method is advisable to eliminate fines and to provide a more uniform size of lump.

Packaging: Charcoal must be packaged in some manner for the retail market. Ten-pound bags are the most common size sold, and color-printed, multiwall kraft bags are most often used. Such a bag in quantities of 5,000-10,000 would probably cost 8-10 cents each, Cardboard boxes are stronger and ship better but usually cost more than bags. Where competitive merchandising isn't a problem, secondhand paper flour or feed sacks can be used; these hold from 20-25 pounds of lump charcoal. But package attractiveness is important in grocery or drug stores where customers choose goods from display counters.

Marketing: There are several methods of marketing charcoal. The small producer may be able to market his production in the local community by selling directly to retailers or directly to customers. The larger producer might have to reach out 50 or 100 miles from his plant—perhaps developing a regular delivery route or selling to wholesale houses.

Many types of retail outlets handle charcoal. Formerly fuel and lumber dealers and hardware stores were the major outlets. Now, grocery stores are leading the field in sales volume. Mail-order houses, sporting goods stores, auto supply stores, service stations, etc. also retail charcoal.

A survey of charcoal marketing in Iowa in 1955 showed that per-capita sales were highest in communities of 5,000-10,000 population. Total buying then amounted to about ½ pound per person; this has probably increased to about 1 pound or more now. In the New England states, where interest in outdoor cooking developed earlier, buying amounts to better than 2½ pounds per person. Use in Iowa will probably continue to grow with the popularity of outdoor cooking.

The average retail price for briquette charcoal in 10-pound bags is 10 cents per pound but varies from 8 to 12 cents. Retailers usually pay from 5 to 8 cents per pound delivered at the store in bags. The wholesale value of un-

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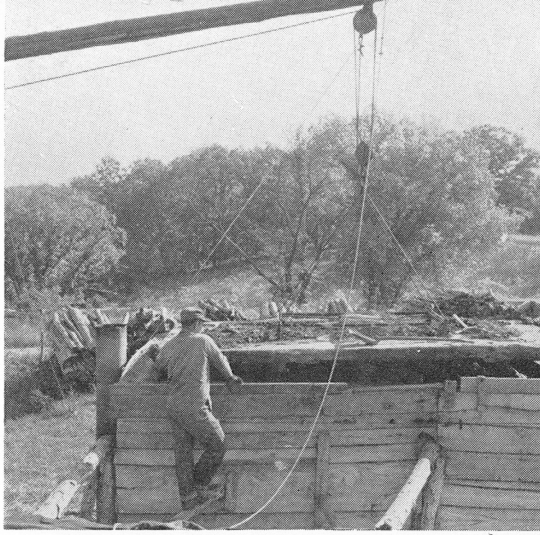
Kiln being filled with dry oak and hickory wood. Mixed roundwood from about 2 to 12 inches in diameter is used.



Roof being set in place after filling kiln; end door may be used instead of removable roof.

packaged bulk charcoal is around 2 to 2½ cents per pound. The cost of packaging lump charcoal might vary from 1 to 2 cents per pound, and distribution costs might range from 1 to 2 cents per pound.

Briquette or Lump? Most of the charcoal sold in Iowa is the briquette type. Briquettes are made by crushing lump charcoal into "fines," mixing it with water or steam and a binding agent and reforming the mix under pressure. This makes a dense, uniform piece of charcoal. However, briquetting plants are relatively expensive.

Lump charcoal can be used for cooking just as well as briquettes. People in this area, however, are accustomed to buying and using the briquette form; the lump charcoal doesn't sell as readily as briquette at the present time. At the same time, customers are price conscious, and it appears that many people would be attracted to buying lump charcoal if offered at a lower price than briquettes. Also, the "natural and unchanged" appearance and "farm-produced" form of lump charcoal might form the basis of a merchandising program.

Plants: Charcoal plants could be established in several ways. You might furnish your own wood and operate your own kilns on a part- or full-time basis. This would be a small operation confined to local retail outlets. Existing farm equipment would be used for harvesting the wood and handling the charcoal. Advantages include nearness to local market and relatively low investment and production costs. Possible disadvantages: insufficient experience or skill to make consistently good-quality charcoal, limited market outlets, inability to provide suitable packaging for competitive merchandising and distraction from other farm activities.

Another method would be for a number of individuals to produce charcoal on their farms and to sell it in bulk to a processor with facilities for packaging and marketing the product in briquette or lump form.

A third possibility would be in the operation of a battery of kilns, with wood coming from farms within a 10- or 15-mile radius. This would be a relatively large—and, perhaps, a cooperative—operation producing enough charcoal to take advantage of large-scale packaging and marketing practices.

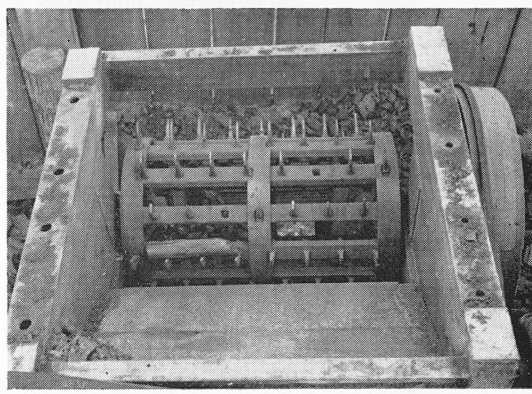
Success? Economic considerations are important in thinking about producing or marketing charcoal. Quite a lot of labor is involved in turning wood into charcoal. Economic success or failure would depend to a large extent on degree of mechanization and management. We do not have enough information available to indicate whether local producers of lump charcoal can compete successfully with the briquette manufacturers. We are presenting what information is available, because many people have been inquiring about charcoal production and marketing.

Remember that a cord (128 cubic feet) of seasoned round hardwood yields from 800 to 1,000 pounds of charcoal. At pres-

Possible Costs and Returns per Cord of Wood for Bulk Charcoal at the Plant.

850 pounds, charcoal		YIELD	850 pounds, charcoal
$17.00		WORTH	$21.25
(at 2¢ per pound)			(at 2½¢ per pound)
		COST ITEMS	
$ 9.00		Wood delivered at kiln per cord	$ 9.00
0.45		Interest on wood, 1 year at 5%	0.45
1.25		Depreciation of kiln per cord	1.25
10.70		TOTAL	10.70
	$ 6.30	BALANCE	$10.55
6.75		PROCESSING LABOR	6.75
		(5 hours per cord at $1.35 per hour)	
	—0.45	PROFIT	3.80

Cold charcoal after burning; volume is about half, and weight, about one-quarter, of that of the original wood used.

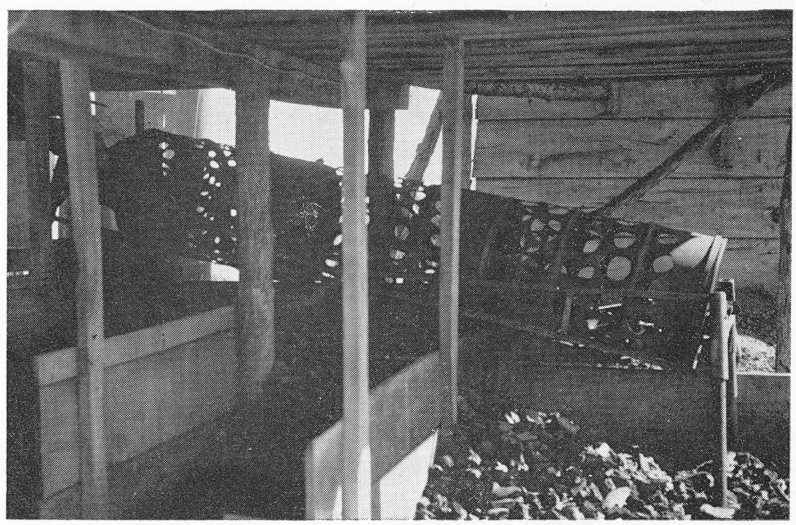


Above: Lump charcoal being run through cracking machine to reduce large lumps. Right: A modified corncob crusher can be used to reduce large charcoal lumps.

ent charcoal market prices, the small operation isn't likely to be feasible if wood hauled to the kiln costs more than $8-$10 per cord. The table illustrates an approximation of the costs and returns per cord of wood for bulk charcoal at the plant.

Some of the possible expense items not included would be property taxes, equipment operation and depreciation, land rent and supervision. As the table shows, at a rate of 2 cents per pound for bulk charcoal, the operation might result in a loss unless wood is obtained for less than $9 per cord or if labor is charged at less than $1.35 per hour. If bulk charcoal is worth 2½ cents per pound, however, then a good return appears possible if wood can be obtained for near $9 per cord. Here, investment per cord of wood is $10.70 for wood, kiln depreciation and interest, and $6.75 for processing labor—making the total cost per cord $17.45. The return over costs is $3.80 per cord, or a margin for profit and risk of about 20 percent.

In considering charcoal production, think carefully about what your probable cost of production would be. Likewise, check on possible market outlets to find out if and how much they're willing to buy and at what price and type of package. Then consider other alternatives available to you for investing your labor and capital to see what offers the best opportunity.



A homemade charcoal screener for eliminating "fines" and sorting lumps to more uniform classes of sizes.

Charcoal packages: On left is a printed, multiwall kraft bag; costs about 10 cents; holds 10 pounds of lump charcoal. At right is a second-hand flour sack; costs 2-3 cents; holds 20-25 pounds of lump charcoal. Small bag (center) holds about 2 pounds.